

CONTROLLABLE PIXEL BORDER FOR
A NEGATIVE MODE PASSIVE
MATRIX DISPLAY DEVICE

5 ABSTRACT OF THE INVENTION

A display device having a display matrix including a pixel border of width x and located around the edge locations of the matrix for improved viewability. In particular, the border can be several pixels wide, e.g., $1 < x < 5$. In one embodiment, the border region is two pixels wide and surrounds a display region in which images are generated from a frame buffer memory. Both the border region and the display region are implemented using a negative mode passive display matrix using liquid crystal display (LCD) technology. The pixels of the border are controllable between an on state and an off state and have an adjustable threshold voltage level. In one embodiment, the display screen is a negative mode display in which the pixels are normally black when off. The pixel border is useful in providing contrast in display modes having a white background with black characters displayed therein. In these display modes, the border region is uniformly turned on to provide a white border. The invention can be applied in monochrome or color displays. The pixel border is also advantageous in that it can be used with conventional character generation processes of the operating system of the computer used to drive the display screen. In one embodiment, the novel display can be used within a portable computer system or other portable electronic device.